



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

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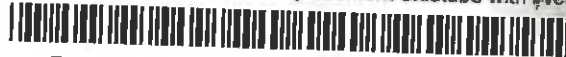
D119-646-041
Job Sheet 168935-D



Part No: D119-646-041

Job Qty: 1 pcs

Part Name: AW119 Replacement Skidtube with Wearpads - Fits LH or RH



Part Weight: 0 lbs

Status: Scheduled

Priority: High

Job Created: 11/27/17

Job Tracking No:

Due Date: 12/8/17

Created By: Mario Poulin

Type: SOLD

Description:

Note: DWG IIN-D119-646 REV D, D3887-041 REV E SHEETS 1,2,5,7,8,10,11 IPP RevA: New issue DD verified by:EC IPP rev B 10.02.22 per PAR 09-043 EC verified by:DD IPP REV C 12.11.05 (DEOD3887-B-1)(ecn 12-675) DD verf.JLM IPP REV:D 13.03.20 per chg003 ECN13-534 DD verf.JLM IPP REV:E 17.05.19 as per dwg D3887 rev.e DD verf.JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	12/7/17	12/7/17	0.00	0.00	Start Up Skidtubes		
110	Skidtubes	1 pcs	12/7/17	12/7/17	0.00	0.25	Skidtubes		
120	HandFinish	1 pcs	12/7/17	12/7/17	0.00	0.83	HandFinish1		
121	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC7		2017-12-05 JSC
122	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		
130	Skidtubes	1 pcs	12/7/17	12/7/17	0.00	1.54	Skidtubes		
135	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		
140	Skidtubes	1 pcs	12/7/17	12/7/17	0.00	1.47	Skidtubes		
150	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		
160	Skidtubes	1 pcs	12/7/17	12/7/17	0.00	1.61	Skidtubes		
170	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		
180	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC10		38 DAS
190	HandFinish	1 pcs	12/7/17	12/7/17	0.00	0.83	HandFinish2		
200	Powdercoat	1 pcs	12/7/17	12/7/17	0.00	0.22	Powdercoat1		SA 18-3-12
210	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC3		BR 18-3-15
220	HandFinish	1 pcs	12/7/17	12/7/17	0.00	3.83	HandFinish4		11 18-3-13
230	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		11 18-3-15
240	HandFinish	1 pcs	12/7/17	12/7/17	0.00	1.43	HandFinish4		11 18-3-15
245	QC	1 pcs	12/7/17	12/7/17	0.00	0.00	QC5		11 18-3-16
250	HandFinish	1 pcs	12/8/17	12/8/17	0.00	0.33	HandFinish3		
251	QC	1 pcs	12/8/17	12/8/17	0.00	0.00	QC5		
255	DC	1 pcs	12/8/17	12/8/17	0.00	0.00	DC		
260	Packaging	1 pcs	12/8/17	12/8/17	0.00	0.00	Packaging3		
270	QC21-FG	1 Ea	12/8/17	12/8/17	0.00	0.00	QC21		
310	Powdercoat	1 pcs	12/8/17	12/8/17	0.00	0.00	Powdercoat1		

Part Op 110 - 1- inspect Mat'L D2500-1-190 for damage 2-Cut tube to length as per dwg D3887 (154.8") 3- Ensure squareness of Descriptions: ends and scribe batch#

130 - 1- Install drill Jig DT9477 drill X-bolt spacer pilot holes using 3/16" drill first side only. 2- 2nd side, locating from first saddle holes use DT9861 A/B to drill 2nd side fwd saddle holes. 3- 2nd side locating from fwd saddle drill remaining crossbolt spacer holes using DT9477 4- Open crossbolt spacer holes to finished size as per dwg D3887 (section D-D and E-E) ***DO NOT OPEN FWD Saddles Holes*** 5- Deburr, blow out chips from inside of tube 6- Bond web in place as per Dwg D3887 & QSI 015. A/R

Sikaflex 8 M138654

Plex 11/27/17 8:56 AM dart.poulin.mario
2018-04-21

P.T.O.

140 - 1- Bend FWD end of tube using bender 1 and FOLIO 31 bend prog. D3887. ***Must use bending aid DT9544, ensure proper positioning*** 2- Cut FWD end of tube as per dwg D3887. ***Verify measurement*** 3- Buff out marks left from bending 4- Drill FWD cap holes using DT8215. Open FWD & AFT cap holes to 0.208" 5- Open FWD saddle holes to finished size as per dwg D3887 6- Drill FWD x-bolt spacer holes using DT9816 and open to finished size. (verify measurement) 7- Drill Tow ring hole, using DT10047 locate from FWD saddle hole. (verify measurement). Open to finished size. 8- Drill 1.87" and 3.74 holes using DT10045 A&B locate from FWD saddle hole. (verify measurement) as per dwg. 9- C'sink FWD cap hole as per detail "C" 10- Drill holes for wearpads using DT8931, open to 0.297". 11- Countersink crossbolt spacer holes, and prepare tube for welding, deburr. 12- Deburr and blow out chips from inside of tube.

160 - NOTE: TACK IN 2 MOST FWD X-BOLT SPACERS AND TEST FIT FWD GROUND HANDLING FIXTURE, IF FIXTURE FITS WELL THEN PROCEED. FIXTURE DT10091. 1- Insert crossbolt spacers. Weld as per QSI 004 and Dwg D3887. Remember to back drill each hole before welding the other side. Use aluminum rod A/R 2- Grind cross bolt welds flush as per Dwg D3887. Ensure no pin hole. 3- Counterbore 5/16" x 0.750" deep as per Dwg D3887. 4- Deburr & Scribe batch # on Aft end of tube.

170 - TEST FIT USING FIXTURE DT10091.

190 - Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch.

200 - START TIME: 9:15 FINISH TIME: 9:45 ON 1:300 M 13470

220 - 1- Install inserts as per Dwg D3887.

240 - 1- Install wearpads, gaskets as per Dwg D3887. Put sikaflex in insert before installing bolts and washers

255 - Photocopy bluefile & type labels per PPP D119-646-041 CHG004

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D2500-1-190 69717	1	51	0	0
140-Skidtubes	D2579 5000719	2	41	0	0
	D3885-1 5162425	1	30	0	0
160-Skidtubes	D2855-5 5016424	1	128	0	0
	D3681-1 5019147	12	111	0	0
	D3903-1	12	143	0	0
230-QC	ALS4-1032-130 5007274	33	11,988	0	0
240-HandFinish	ALS4-1032-225 5048375	1	1,836	0	0
	AN3C4A 5019394	6	993	0	0
	AN3C5A 5019396	26	280	0	0
	D2855-3 F153241	1	28	0	0
	D3492-5 5024248(21)	24	155	0	0
	D3672-1 F150071	2	1,741	0	0
	D3847-1 5036137	5	30	0	0
	D3847-11 5010683	1	24	0	0
	MS24694-C52 F11137451	2	170	0	0
	NAS1149C0332R 5011236	32	3,215	0	0
	NAS1611-005 5007808	24	820	0	0

5038391 (63) →

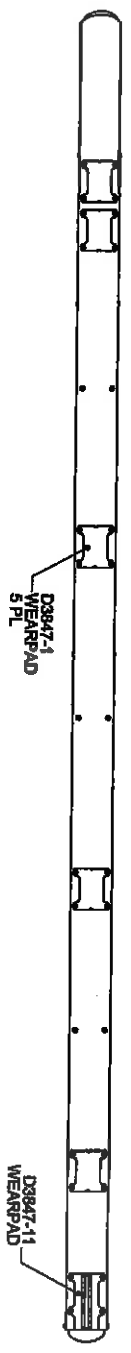
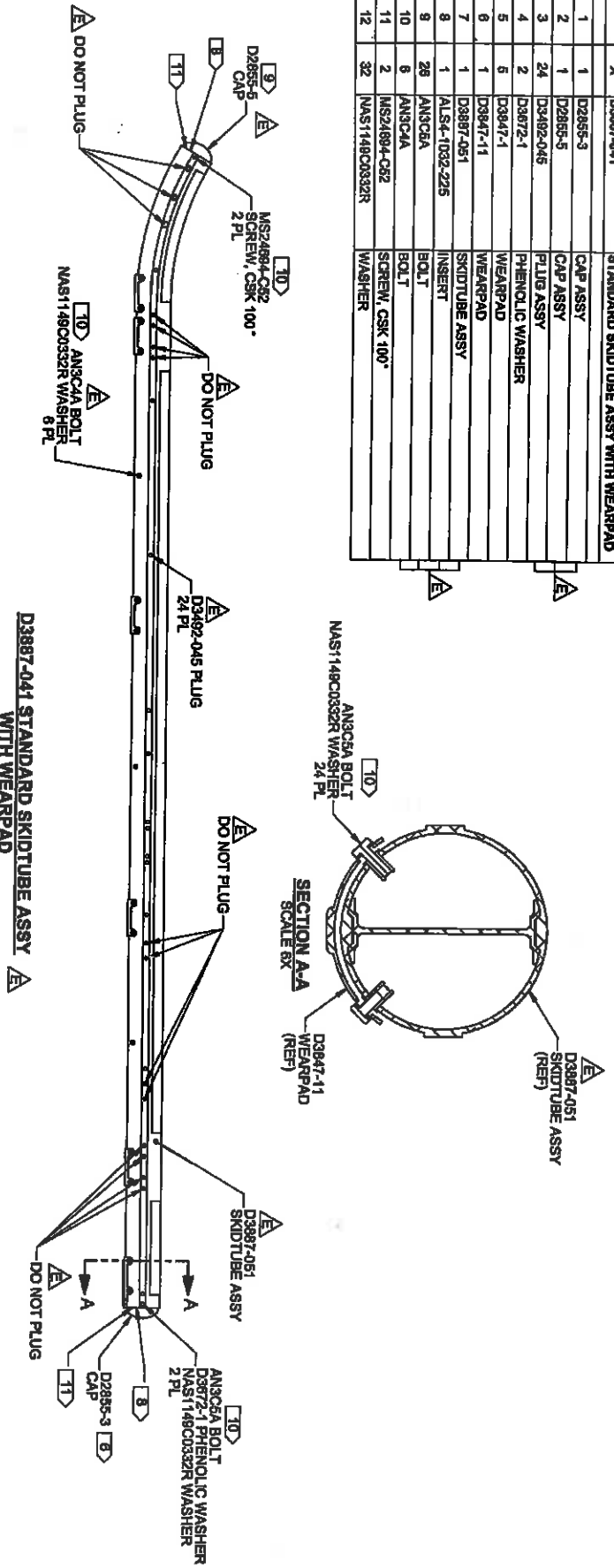
Part Specifications

Specifications could not be found.

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ITEM	QTY	PIN	DESCRIPTION
1	1	D3887-041	STANDARD SKIDTUBE ASSY WITH WEARPAD
2	1	D2855-3	CAP ASSY
3	24	D3492-045	PLUG ASSY
4	2	D3872-1	PHENOLIC WASHER
5	6	D3847-11	WEARPAD
6	1	D3887-051	SKIDTUBE ASSY
7	1	AL54-1032-225	INSERT
8	28	AN3CA	BOLT
9	2	MS24894-C82	SCREW, CSK 100°
10	2	MS24894-C82	WASHER
11	2	MS24894-C82	WASHER
12	2	MS24894-C82	WASHER

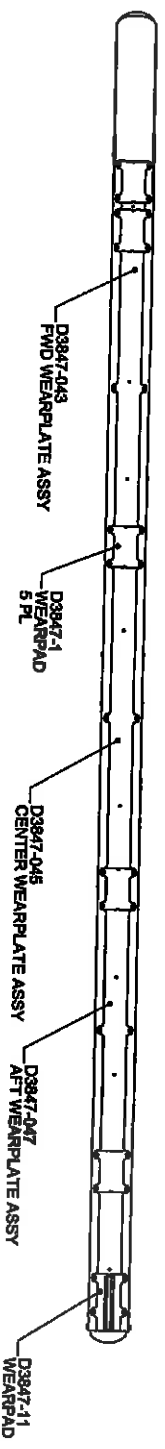
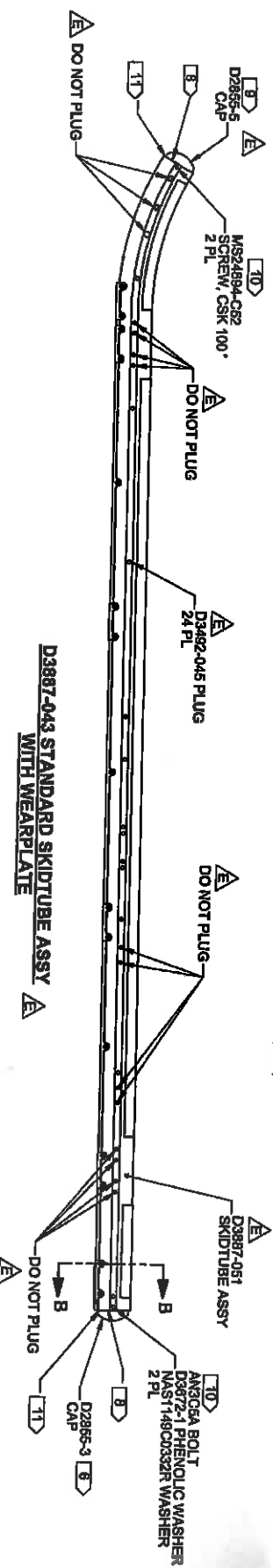
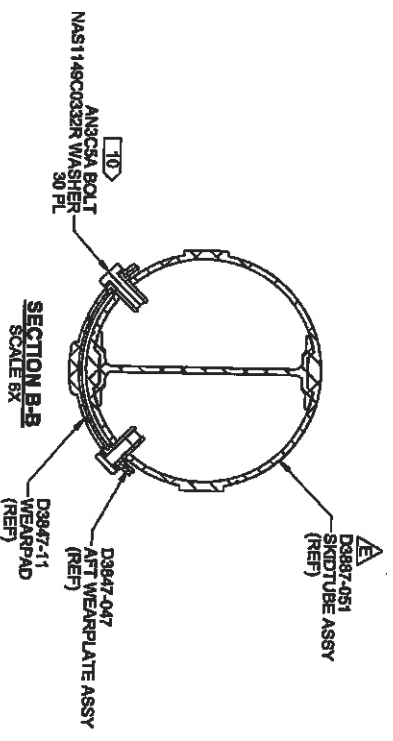


NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: NONE
- 3) TOLERANCES: PER PART OSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH PART PIN "D3887-041" AND BATCH NUMBER PER OSI 044 8.4
- 7) WEIGHT: 32.0 lbs
- 8) RELIEVE NUMBER RIDGE OF EXTRUSION, AS NEEDED, TO ALLOW FOR INSTALLATION OF D2855-3 AND D2855-5 CAP ASSY, ALUMINE BARE MATERIAL
- 9) USE D3887-051 SKIDTUBE ASSY TO LOCATE AND BACKDRILL UNDRILLED INSERT HOLE INTO D2855-5 CAP. OPEN HOLE TO Ø0.287, ALUMINE BARE MATERIAL AND INSTALL AL54-1032-225 (OR AK57-1032-225, OR AL57-1032-225, OR AK54-1032-225) INSERT ON INSIDE OF CAP.
- 10) SEAL FASTENERS WITH SIKAFLEX -241/291 OR PROSEAL 880 OR MIL-S-8902 CLASS B2 SEALANT
- 11) SEAL MATING SURFACES WITH SIKAFLEX -241/291 OR PROSEAL 880 OR MIL-S-8902 CLASS B2 SEALANT

DESIGN	RF	WKS	DART AEROSPACE USA, INC.
CHECKED	DD	RF	ELIGIBLE OR
WFG, APPR.	DD	RF	REV. E
APPROVED	HS	RF	SHEET 2 OF 11
DATE	17.02.03	RF	SCALE
		RF	NTS

ITEM	QTY	P/N	DESCRIPTION
	X	D3887-043	STANDARD SKIDTUBE ASSY WITH WEARPLATE
1	1	D2855-3	CAP ASSY
2	1	D2855-5	CAP ASSY
3	24	D3482-046	PLUG ASSY
4	2	D3672-1	PHENOLIC WASHER
5	1	D3647-043	FWD WEARPLATE ASSY
6	1	D3647-045	CENTER WEARPLATE ASSY
7	1	D3647-047	AFT WEARPLATE ASSY
8	5	D3647-1	WEARPAD
10	1	D3887-051	SKIDTUBE ASSY
11	1	ALSA-1032-225	INSERT
12	32	ANSCA	BOLT
13	2	MS24894-C52	SCREW, CSK 100°
14	32	NAS1148CQ32R	WASHER



NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D3887-043" AND BATCH NUMBER PER QSI 044 8.4 ON THE ID OF THE TUBE, BEFORE INSTALLING THE AFT D2855-3 CAP
- 7) WEIGHT: 37.0 lbs
- 8) RELIEVE INNER RIDGE OF EXTRUSION, AS NEEDED, TO ALLOW FOR INSTALLATION OF D2855-3 AND D2855-5 CAP ASSY. ALUMINE BARE MATERIAL
- 9) USE D3887-051 SKIDTUBE ASSY TO LOCATE AND BACKDRILL UNDERLID INSERT HOLE INTO D2855-3 CAP. OPEN HOLE TO 0.0287" ALUMINE BARE MATERIAL AND INSTALL ALSA-1032-225 (OR AK57-1032-225 OR AK57-1032-225) INSERT ON INSIDE OF CAP.
- 10) SEAL FASTENERS WITH SIKAFLEX -241/291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT
- 11) SEAL MATING SURFACES WITH SIKAFLEX -241/291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT

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2017-05-08

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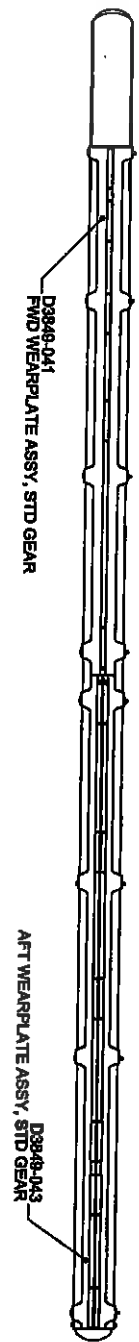
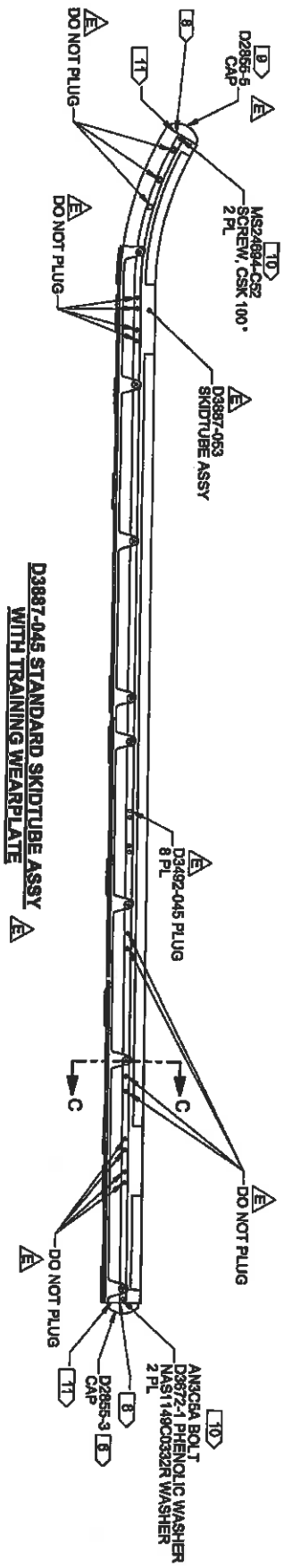
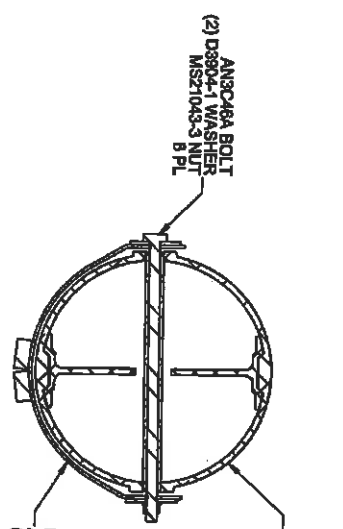
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DRAWN	WV	WV	EUGENE, OR
CHECKED	RF	RF	D3887
MFG. APPR.	DD	DD	SHEET 3 OF 11
APPROVED	HS	HS	SCALE
DATE	17.02.03	DATE	17.02.03

1119 STD SKIDTUBE ASSY

REVISIONS

NO.	DATE	DESCRIPTION
1	17.02.03	INITIAL RELEASE

ITEM	QTY	P/N	DESCRIPTION
X	1	D3887-045	STANDARD SKIDTUBE ASSY WITH TRAINING WEARPLATE
1	1	D2855-3	CAP ASSY
2	1	D2855-5	CAP ASSY
3	8	D3492-045	PLUG
4	2	D3672-1	PHENOLIC WASHER
5	1	D3849-041	FWD WEARPLATE ASSY, STD GEAR
6	1	D3849-043	AFT WEARPLATE ASSY, STD GEAR
7	1	D3887-033	SKIDTUBE ASSY
8	16	D3904-1	WASHER
9	1	AL 84-1032-225	INSERT
10	8	AN3CA18A	BOLT
11	2	AN3CA3A	BOLT
12	8	MS24894-C32	NUT, SELF-LOCKING
13	2	MS24894-C32	SCREW, CSK 100°
14	2	MS1148C332R	WASHER



- NOTES:
- 1) MATERIAL: N/A
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: N/A
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D3887-045" AND BATCH NUMBER PER QSI 044 6.4
 - 7) WEIGHT: 38.1 lbs
 - 8) RELIEVE INNER RIDGE OF EXTRUSION, AS NEEDED, TO ALLOW FOR INSTALLATION OF D2855-3 AND D2855-5 CAP ASSY. ALUMINE BARE MATERIAL.
 - 9) USE D3887-033 SKIDTUBE ASSY TO LOCATE AND BACKDRILL INSERT HOLE INTO D2855-5 CAP. OPEN HOLE TO Ø0.287, ALUMINE BARE MATERIAL, AND INSTALL AL 84-1032-225 OR AN37-1032-225, OR AN34-1032-225 INSERT ON INSIDE OF CAP.
 - 10) SEAL FASTENERS WITH SIKAFLEX -241/281 OR PROSEAL 880 OR MIL-S-8802 CLASS B2 SEALANT
 - 11) SEAL MATING SURFACES WITH SIKAFLEX -241/281 OR PROSEAL 880 OR MIL-S-8802 CLASS B2 SEALANT

RELEASED
N 2017-05-08

APPROVED

DESIGN	RE	DATE	REVISION
DRAWN	WK		
CHECKED	RF		
INFG. APPR.	DD		
APPROVED	H8		
DATE	17.02.03		

DART AEROSPACE USA, INC.
ELIGINE, OR

D3887

A119 STD SKIDTUBE ASSY

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SHEET 4 OF 11

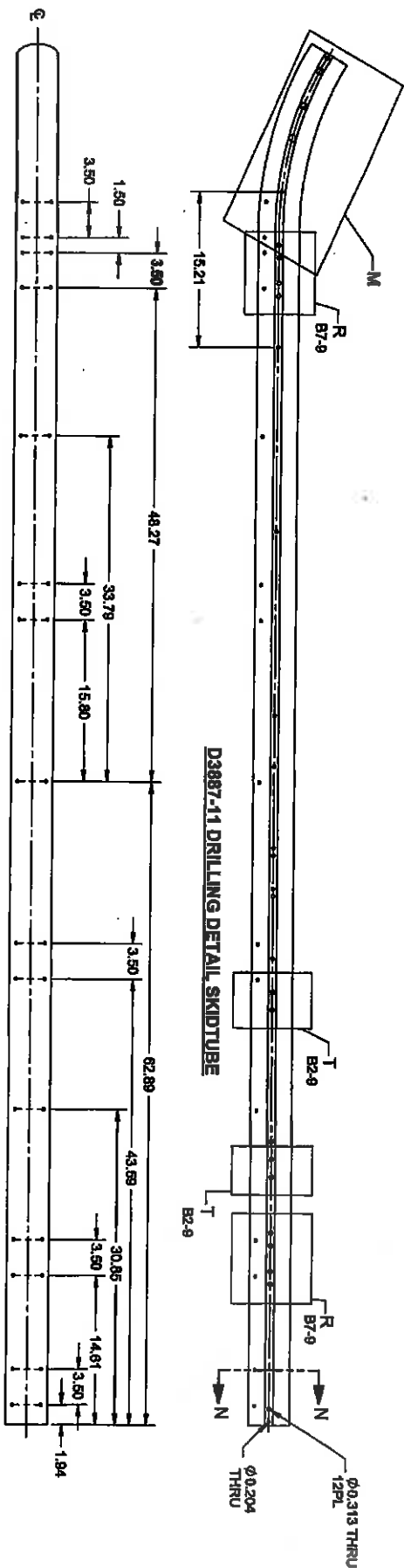
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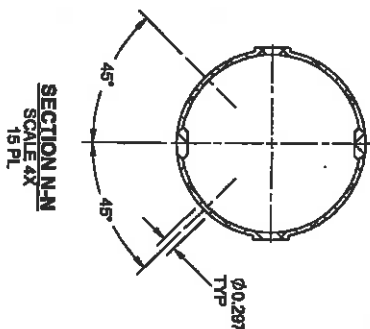
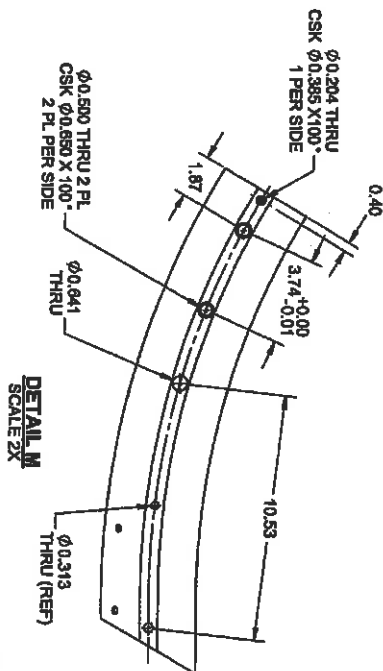
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DEPARTMENT OF DEFENSE AVIATION AEROSPACE USA, INC.
AEROSPACE AND CONSTRUCTION GROUP, 10000
LINDEN ROAD, FORT MONROE, VA 22061-5000
ATTENTION: MR. JAMES M. HARRIS, JR.
TELEPHONE: (703) 754-2222
FAX: (703) 754-2222
E-MAIL: JAMES.HARRIS@DOD-USA.MIL



WEARPADWEARPLATE HOLE PATTERN
FOR REFERENCE ONLY
DRILL USING DT8831 TEMPLATE

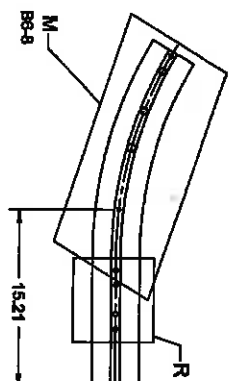


- NOTES:
- 1) MATERIAL: MAKE -11 FROM -1 BEND DETAIL
 - 2) FINISH: CHEMICAL CONVERSION COAT PER DART OSI 008 4.1
 - 3) TOLERANCES: PER DART OSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK: SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY AT FINAL ASSEMBLY
 - 7) WEIGHT: N/A
 - 8) USE DART DRILL TEMPLATE DT8831 TO LOCATE AND DRILL Ø0.287 HOLES FOR WEARPADWEARPLATE INSERTS.

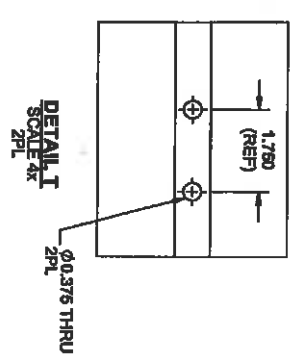
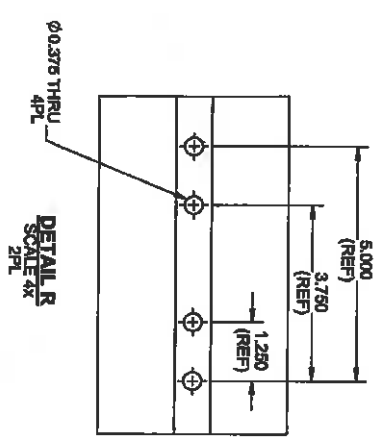
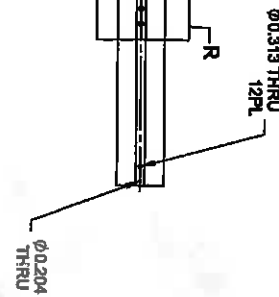
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2017-05-08
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CHECKED	RF	REV. E
MFG. APPR.	DD	D3087
APPROVED	HS	A119 STD SKIDTUBE ASSY
DATE	17.02.03	SCALE
		NTS

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D3887-13 DRILLING DETAIL SKIDTUBE

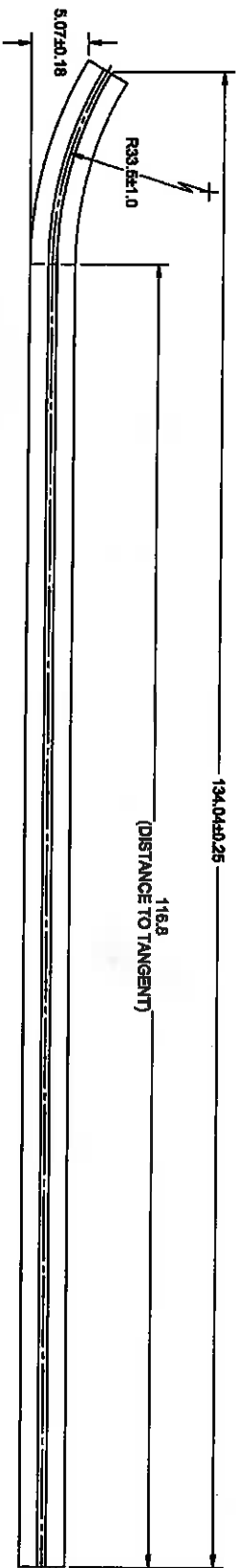


- NOTES:
- 1) MATERIAL: MAKE -13 FROM -1 BEND DETAIL.
 - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK: SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY AT FINAL ASSEMBLY
 - 7) WEIGHT: N/A

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2017-05-08
APPROVED

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CHECKED	RF	DRAWING NO.
INFG. APRR	DD	D3887
APPROVED	HS	REV. E
DE APRR	DS	SHEET 9 OF 11
DATE	17.02.03	SCALE
		WTS

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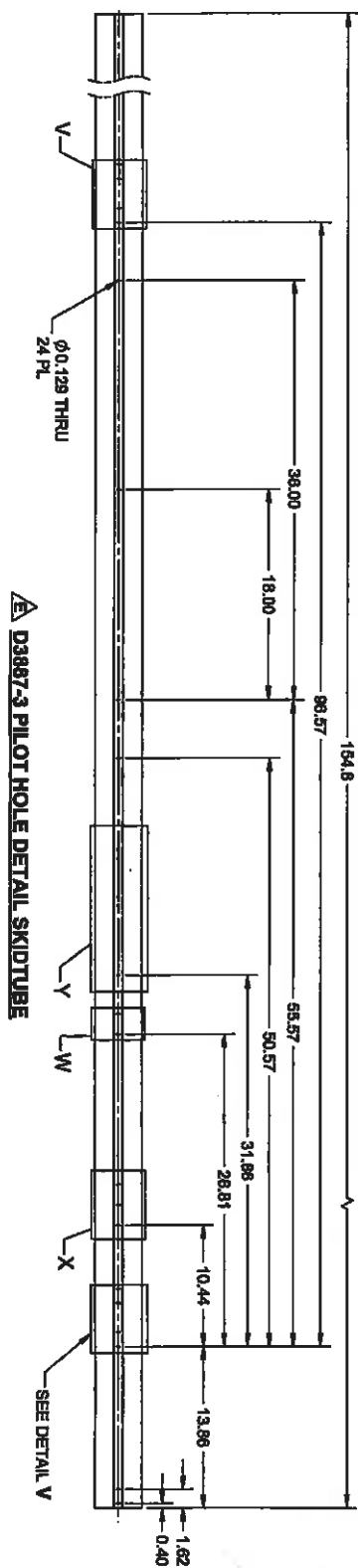


H = 4.75" → 4.89 in (0.14" out of tol)
L = 134.375" → 134.29" Max (0.085" out of tol)

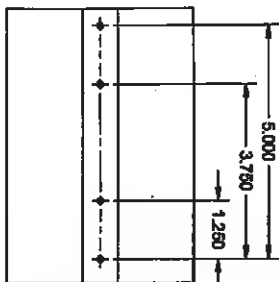
- NOTES:**
- 1) MATERIAL: MAKE -1 BEND DETAIL FROM -3 PILOT HOLE DETAIL
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER PART 021.018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY AT FINAL ASSEMBLY
 - 7) WEIGHT: N/A
 - 8) DAMAGE TOLERANCE ON FWD BEND:
 THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 8.5 INCHES ABOVE THE GROUND. IT IS ACCEPTABLE TO POLISH OUT GOUGES UP TO 0.020" DEEP IN THE BENT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.

RELEASE
 2017-05-08
 APPROVED

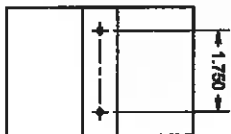
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MFG. APPR.	DD		REV. E
APPROVED	HS		BHEET 10 OF 11
DE APPR.	DS		SCALE
DATE			NTS



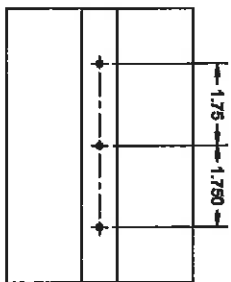
△ D3887-3 PILOT HOLE DETAIL SKIDTUBE



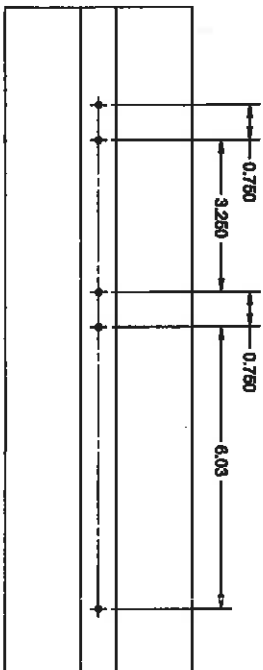
DETAIL V
SCALE 4X
2 PL



DETAIL W
SCALE 4X



DETAIL X
SCALE 4X



DETAIL Y
SCALE 4X

- NOTES:**
- 1) MATERIAL: MAKE FROM D2600-1-190 EXTRUSION
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY AT FINAL ASSEMBLY
 - 7) WEIGHT: N/A

RELEASED
2017-05-08

APPROVED

DESIGN	RF	RF	DART AEROSPACE USA, INC.
DRAWN	WK	WK	EUGENE, OR
CHECKED	RF	RF	REV. E
WFO, APPR.	CD	CD	D3887
APPROVED	HS	HS	SHEET 11 OF 11
DATE	17.02.03	DATE	SCALE
			NTS

A119 STD SKIDTUBE ASSY

WMD 18 Jun 2019

DQA: _____ Date: _____

QA Closed: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



Work Order update only

AGAINST DEPARTMENT/PROCESS

DISPOSITION

Skid-tube	☒	Cross tube	☐	Water Jet	☐
Machining	☐	Small Fab	☐	Prod. Eng. Coord.	☐
Thermoforming	☐	Finishing	☐	Rec/Store/Packaging	☐
Large Fab	☐	Composite	☐	Supplier	☐

Rework	☐
Scrap	☐
Use-as-is	☒
Suspected Unapproved	☐

Work Order: 168935-D	Step #: 140	QTY Effective: 1	Disposition: ☒
Part No: D3887-1	Description Work Order Deviation		
NCR No: 19-7174	MRB (QS042) Approval: <i>[Signature]</i> 2017.12.19 N. Montenegro P.F. CHAS Montenegro		
Date: 2017.12.19	Completed By: <i>[Signature]</i> 180817 Lead hand / Supervisor: <i>[Signature]</i> 180517 Approval Verification: <i>[Signature]</i> 180517		

CROSSTUBE D3887-1 WAS MANUFACTURED OUT OF TOLERANCES 5.07±0.18 IS 4.75, 0.14" under tolerance. 134.04±0.25 IS 134.29" 0.065" above tolerance.

This deviation in manufacturing is not expected to be detrimental to the skid tube structure, and is acceptable for this work order only.

Chris Montenegro accepted this deviation SIGNED BY WILL MONTENEGRO on his behalf. *[Signature]* W. MONTENEGRO 2017.12.19

FAULT CATEGORY

Root Cause

Environment	No Re-verification	Pressure/Forced	Temperature/Cure	Power Loss/Surge	Positioned Wrong
Design	Operator	Bending	Set-up	Folio/Program	Outside Dimensions
Doc/Data	Offset/Setup	Centre Not Concentric	BOM/Route	Grain	Over/Under tolerance
Equip/Tooling	Supplier	Cracks	Broken/Damage/Defect	Weld	Part Incorrect
Handling/Pre	Training	Crimp/Kink/Ripple/Wave	Inspection Incomplete/Unqualified	Wrong Stock Pulled	Part Lost/Missing
Material	Use for Testing	Cuffs	Contamination	Out of Sequence	Part Moved
Internal Transport	Poor Information	Crushing	Countersink	Off-set	Drawing
Tribal Knowledge	Rushing	Heat Treat	Cut Too Short	Mislabeled	Finish
LOA	Product Improvement	Wave/Twist in Tube	Instructions Incomplete/Unclear	Fit/Function	Misread
Substation	Process Improvement	Marks/Chatter	Drill Holes	Misaligned/off center	Turning Sequence
Past Expiry Date	Manufacturing Process				
Misidentified	Past Due				
OTHER: _____					